

(Breakthrough. March 1987)

METAMUSIC

Suzanne Evans Morris

BREAKTHROUGH is pleased to offer a Special Edition this quarter showcasing the Metamusic Tape series.

Contributing author, Suzanne Evans Morris, Ph.D., has worked extensively with the Metamusic® tapes in her therapy with young, developmentally disabled children. Realizing the need for comprehensive, explicit documentation of Metamusic for professional use and as a guide for potential buyers, Dr. Morris has summarized the results of her experience and research for BREAKTHROUGH.

We believe you will find her report interesting and informative.

A Journey Into Metamusic

When Bob Monroe released the first Metamusic tapes (*Soft and Still*, *Metamusic Blue*, and *Metamusic Green*), it offered me the opportunity to explore the use of the Hemi-Sync® process with the young, non-verbal children with whom I work. It was a very exciting step since the children had been totally bored by my earlier attempts to provide a non-verbal therapy background with the *Surf* and *Concentration* tapes. Tapes with verbal material appropriate for young children were nonexistent. I usually played each tape for the child in several sessions, observed specific responses, and decided which tapes could be used in my therapy. It was a relatively easy decision. Most of the children showed a strong preference for *Metamusic Blue*; many became agitated or withdrawn with *Metamusic Green*. The major difference appeared to be the presence of a discordant section in *Green* that was upsetting to the nervous system. In addition, my own preference was also for *Metamusic Blue*, and I wondered if some of the children responded better with this tape simply because my responses were more in-tune and harmonious with music that was a better fit for me. Listening to *Metamusic Blue* for 5-6 hours per day was quite an experience! I longed for greater variety. Some children liked *Soft and Still* although it was generally not as calming or attractive to the younger children. It, however, offered a change of pace for the therapist which was welcomed. This need for variety was also satisfied somewhat by the purchase of a Hemi-Sync Synthesizer that allowed me to mix my own musical selections with the Hemi-Sync signals. Some children responded much better to the pre-recorded tapes than they did to individual tapes made with the synthesizer. My own perception was that the synthesizer provided a weaker or less powerfully focused effect than the tapes made in the lab. Since both apparently contained the same Hemi-Sync signals, I couldn't explain the differences I was seeing. Was it a function of the music? Were the signals produced in the lab somehow different from those created by the synthesizer? These

observations and questions triggered an extensive library search for information on music and many questions for Bob Monroe.

In 1985 opportunities increased for discovering the answers to my questions. An additional 22 Metamusic tapes were released. Although the variety was wonderful, it became harder to sort out what I was experiencing. I had no strategy for selecting tapes to use during workshops or in therapy with children. I continued to observe the children's responses to tapes and asked parents what they liked. In May 1986 I included a set of Metamusic tapes in the tape listening room that I had set up during one of my New Visions workshops. The participants in the workshop were rehabilitation specialists and special educators who were also interested in the role of music in the learning environment. Although there was a high level of enthusiasm for the tapes, many expressed the same dilemma that I had experienced. How do you begin to select tapes to listen to? How do you choose tapes that will be liked by parents and children as part of the learning environment? Several individuals indicated that they would have liked to have had some way of recording their responses to a tape. It was difficult to remember which ones were liked and not liked when confronted with a list of possible tapes to purchase. A list of tapes with objective descriptions was requested by many.

These issues and questions served as a catalyst for finding answers for myself, and answers that I could share with others who were forming the same questions. The Metamusic Tape Survey, the Metamusic Tape Description, and the Structure of Metamusic in this special issue of *Breakthrough* represent the initial answers in my search.

The Structure of Metamusic

Metamusic tapes are created from the combination of a series of Hemi-Sync signals and a musical composition. After a piece of music is completed, a "bed" of Hemi-Sync signals is added at a level approximately 20 db below the loudness level of the music. Robert Monroe, executive director of The Monroe Institute, was asked to describe the way in which the Hemi-Sync signals were selected and arranged, and to discuss the interaction between Hemi-Sync and the musical elements of the composition. The answers to the following questions were compiled by Suzanne Evans Morris, Ph.D. from discussions with Robert Monroe on 7/10/86 and 8/26/86.

1. What frequencies do you select in the delta, theta, alpha, and beta ranges for your Hemi-Sync signals?

Each of the brain wave patterns consists of a loosely defined frequency range. For example, the theta range contains frequencies between 3 Hz and 7 Hz. We select a specific frequency from each range in the creation of the Hemi-Sync signals. Two sounds with small differences in frequency are recorded on separate channels of a stereo recorder.

We call these carrier frequencies. As you know, when these are heard by a listener through headphones or open stereo speakers, the brain will create a third tone, or beat frequency, which is equal to the difference between the original frequencies. This becomes the Hemi-Sync signal. In order to help the individual achieve deeper states of relaxation with the Metamusic tapes, we create signals in the delta, theta, and beta ranges for the brain to follow. The delta signal is usually 1.5 Hz. The theta signal is 4 Hz. The beta signal is 16 Hz. Alpha signals are not included in the Metamusic tapes since our research has shown that they are not of particular value in achieving the Hemi-Sync effect.

2. What identified differences have you observed when different carrier frequencies have been used to create the Hemi-Sync signals?

Listeners report different degrees of effectiveness depending upon the carrier signal used. Work in the lab between 1971-1976 indicated that certain carrier frequencies were most effective in achieving and maintaining a desired state of awareness. Certain carrier frequencies work most effectively with certain binaural beats. There are also certain carrier frequencies that are irritating to the listener. For example, if the carrier frequency for the theta signal is above 600 Hz, it is very irritating and the listener tends to reject the signal.

3. How do you decide which sound frequencies will be used to create the Hemi-Sync signal for the Metamusic tapes?

The specific sound frequencies or ranges of sound frequency for each of the signals (i.e. delta, theta, beta) were identified in the early lab studies. Although a study of all frequencies in a sweep with an oscillator would be helpful, certain frequencies were identified by the subjects as being effective and these are the ones that are used. The signals used for the Metamusic tapes are of the same type used for a Focus 10 tape. These consist primarily of delta and theta signals with a beta signal at the end to bring the listener to a state of conscious alertness. The frequency ranges of the carrier signals are generally as follows: Delta: 70-100 Hz; Theta: 150-600 Hz; Beta: below 350 Hz

4. What differences are there among the 24 Metamusic tapes in the carrier frequencies that are selected to create the Hemi-Sync bed?

The same general frequencies have been used in the entire Metamusic series. Where differences occur, they are primarily for tracking or making adjustments to the specific frequencies in the music. This blends the Hemi-Sync with the frequencies in the music so that additional beat frequencies are not created.

5. What is the timing of onset, intensity, and fade-out of Hemi-Sync signals used in the Metamusic tapes? (i.e. differences in relationship between the delta and theta signals, and the relationship of the signals to the music).

The carrier frequencies that create the Hemi-Sync signals are introduced within the first minute of the music. The initial signal is a theta signal created from a carrier frequency of approximately 150 Hz. A delta signal with a carrier frequency under 100 Hz is faded in after approximately 5 minutes. The theta and delta patterns cycle together throughout the remainder of the music. Occasionally a second theta signal will be added for the middle one third of the music. Its amplitude is lower than that of the first theta signal. Its carrier frequency is generally a harmonic of the first carrier frequency. This provides a deeper or more enhanced experience for the listener. If the second theta signal is used, it is faded out in the final third of the piece. During the final 5 minutes the delta signal is gently faded out. This is followed by a gradual fading out of the theta signal and a gradual fading in of a low beta signal with a carrier frequency of approximately 350 Hz.

6. What differences are there among the 24 Metamusic tapes in the pattern of Hemi-Sync signals used in creating the Hemi-Sync bed?

The pattern is identical for most of the Metamusic tapes. Occasionally there will be differences in the timing of the entrance of the Hemi-Sync signal and in the possible addition of a second theta signal (as described above).

7. How many “layers” of Hemi-Sync sounds are used in the bedding for the Metamusic Tapes? For example, do you use only one set of programmable signals to create the theta pattern, or are there multiple frequencies creating numerous theta signals which become blended?

The general blending or layering has been previously described. (See question 5). Signals are gradually faded in during the initial 5 minutes of the music. All of the Metamusic tapes consist of minimally one carrier frequency to create a theta signal and one carrier frequency to create a single delta signal. It is never necessary to use more than one delta signal. Occasionally, a second theta signal will be added for the middle one third of the music to create an enhancement of the listener’s inner experience. A beta signal will be gradually blended into the final minutes of the music as the theta and delta signals are faded.

8. What differences are there among the 24 Metamusic tapes in the layering of carrier frequencies used in creating the Hemi-Sync bed?

Only occasional differences in the onset time of the Hemi-Sync signals and the option of adding a second theta signal in the middle third.

9. The current Metamusic tapes are designed to have no-to-minimal rhythmic and tempo components. What would be the effect on the Hemi-Sync signal if functional or

therapeutic music were composed with a regular rhythm and a specific tempo (such as in the largo and adagio tempos of the baroque music style)?

It is possible to have a momentary rhythm and tempo, but not a continuous one. A continuous rhythm has a very specific tempo, and a regular tempo can create an interference with the Hemi-Sync effect. We also know that both the loudness (amplitude) and rhythm of rock music will totally interfere with the Hemi-Sync. Part of the problem relates to the necessary weakness of the Hemi-Sync signals compared to the high-amplitude and strong rhythm found in rock music.

Because Hemi-Sync creates its own inner rhythms through brain-wave frequency changes, it probably influences the body and mind in the same positive fashion that has been shown in music that relies on the rhythm and tempo components for their effect. Thus, it is probable that a specific rhythm and tempo is not needed. The creation of brain wave frequencies and greater coherence of the brain from the Hemi-Sync creates a more relaxed body state (and slower cardiac and respiratory rates), and a more focused attention for learning. This is also what is seen and/or speculated to occur with specific rhythms and tempos in music. Thus, attempting to create these effects from the combination of Hemi-Sync and specific tempos and rhythms would be redundant and possibly at cross-purposes.

10. What accounts for the observation or perception of different effects of different pre-recorded Metamusic tapes on the same or different listeners? Is this a result of differences in the Hemi-Sync signals or of differences in the music?

It is speculated that the major difference lies in the music itself. Since most of the Metamusic tapes use the same or similar carrier frequencies and Hemi-Sync signals, the major structural difference in the tapes lies in the music itself. We know that people prefer or physically resonate differently to different tones or types of music. This plays an important role in their response to a given piece of music (whether or not it contains Hemi-Sync signals). This is one of the reasons why it is important to have a wide variety of musical forms to use with the same Hemi-Sync patterns.

11. What creates the perception of a deeper, stronger Hemi-Sync effect in the pre-recorded tapes when compared with the same music run through a delta-theta mix with the Hemi-Sync Synthesizer?

Much of the difference is related to the number of signals that a listener is given. The Hemi-Sync synthesizer has only 2 sound generators or oscillators available to create the sounds. In contrast, the pre-recorded tapes use a minimum of 4 sound generators. In addition, it is possible to combine several different theta signals with the delta signal, creating more of a layered effect. This contributes to the depth or enhancement of the listener's imagery or

inner personal experience. In the laboratory-made tapes, different carrier frequencies are selected to create the delta, theta, and beta signals. This is less well-defined in the Hemi-Sync synthesizer and a single carrier signal is used for the difference tones that are the delta, theta, and beta signals.

12. Could Metamusic tapes be designed which would include the specific Hemi-Sync bedding effects found on the *Concentration* tape or the *Sound Sleeper* tape?

Any type or combination of Hemi-Sync signals can be combined with music that is compatible with the carrier frequencies and Hemi-Sync signals. It would be possible to create whatever effect was desired. The most important aspect lies in carefully defining what effects are to be facilitated in the listener. With this knowledge, a Metamusic tape can be created so that both the music and Hemi-Sync are compatible with these goals.

Metamusic Tape Survey

Purpose of the Study

As the number of Metamusic Tapes increased between 1985 and 1986 from 3 tapes to 25 tapes, professionals wishing to use the tapes in a therapeutic or educational setting faced a major challenge. What procedures should be used to select tapes for purchase or for use in therapy? Word-of-mouth recommendations and random purchase and trial use have been the major means of selecting tapes during the past 18 months. This pilot study is an attempt to look at one parameter of selection, the relative musical preferences of a selected group of adults who listened to Metamusic tapes during a workshop or conference experience.

Subjects

53 adults participated in the listening survey between June and October 1986 as part of a larger workshop or seminar. 42 listeners were rehabilitation specialists (i.e. occupational therapists, physical therapists, speech-language pathologists, special educators, dietitians) attending two New Visions workshops on the development of oral feeding skills. 11 listeners were members of the Professional Division of The Monroe Institute attending the Professional Seminar. All listening activities took place at the Conference Center of The Monroe Institute.

Procedure

A tape listening room was established in the Conference Center with 2 each of the 25 Metamusic tapes and portable cassette tape playback units that could be checked out. Workshop participants were encouraged to listen to as many tapes as they wished and to record their listening style and response to each tape on a printed form.

During the New Visions workshops, listening to the tapes was done primarily as the participant was studying, reading, or reviewing workshop material. Often a screening of the tapes

occurred with the individual listening to portions of several tapes to find one that suited his/her needs and preferences. In addition to this individual selection of tapes, sample tapes were played over the stereo speakers in the bedroom area (i.e. CHEC Units) before breakfast and before bed. Two tapes (*Modem* and *Downstream*) were played as background music for 2 guided imagery sessions on feeding skills done under headphones.

During the Monroe Institute Professional Seminar, the individually selected tapes were used primarily as a background for meditation, daydreaming, or reading. In addition, four tapes (*Modem*, *Eddys*, *Trailing Edge*, and *Midsummer Night*) were played through the headphones. Listeners were given no instructions other than to relax with the music. For many, this provided the opportunity for quiet meditation or imaging.

Listeners were asked to indicate whether they listened to the entire tape or a part of the tape, and whether listening was under headphones or over open speakers. Each tape listened to was rated on a 5-point scale. Scores of 1 and 2 were given when the listener disliked the tape. A 3 meant that the individual was neutral, neither liking nor disliking the tape. Scores of 4 and 5 indicated that the listener liked the tape.

Listeners were encouraged to share why they liked or disliked a particular tape in order to obtain greater insight into factors of personal preference.

Each response on the form was entered into a computer spread sheet program. Each tape was analyzed statistically for basic trends of mean, standard deviation, and percentage of listeners who liked and disliked the tape. A minimum of 10 listeners was required for each analyzed tape. The role of partial versus total listening to a tape was also examined to see if this was a factor in personal preference.

Results

The 53 listeners completed 254 ratings on the 25 Metamusic tapes (i.e. an average of 4.8 tapes apiece). This ranged from listening to 1 tape to listening to 22 tapes during a 5 day period. In 105 sessions only part of the tape was listened to and rated. In 149 sessions the individual listened to the entire tape before rating it. No measurable differences were observed between these two listening situations. Therefore, the ratings were combined for the partial and total listening conditions. The number of listeners per tape varied. 8 tapes had 20-33 listeners. 10 tapes had between 10 and 19 listeners. 6 tapes had 2-9 listeners. Tapes with fewer than 10 listeners were discarded from the analysis of the Metamusic Tape Survey (i.e. *Brown and Beige*, *Pantops*, *Outreach*, *Pacifica*, *East By West*, and *Wayward*).

The average (mean) rating score was computed for each tape. Mean scores varied from 4.38 (*Eddys*) to 2.50 (*Sunday*). These ratings are listed in Table 1.

A bar chart was created from the frequency of each rating to look at the distribution of scores. Most tapes showed a wide frequency distribution with ratings spread from 1-5. These distributions were of four general types:

1. *Group A*: Tapes are well-liked by listeners. 70- 85% of the scores are in 4-5 range. Fewer than 10% of the listeners disliked the tape. *Modem, Eddys, Random Access, Midsummer Night*, and *Back Room* fell into this category (Figure 1).

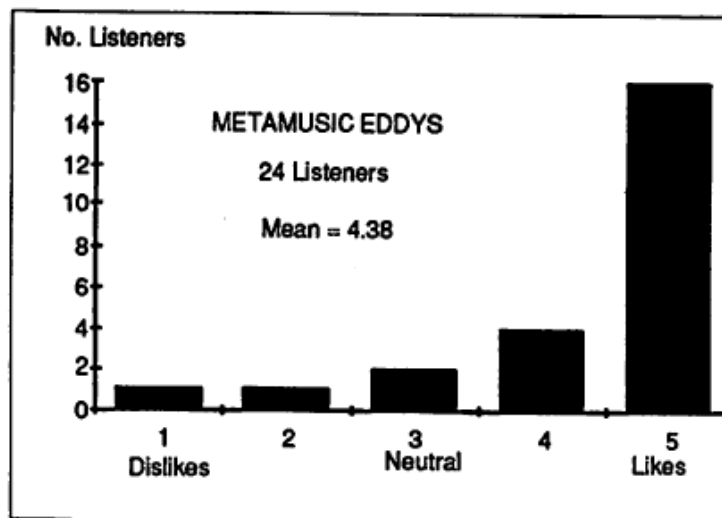


Figure 1

2. *Group B*: Tapes are liked or elicit a neutral feeling from listeners. 65-80% of the scores were in the 4-5 range; 85-100% of the scores were in the 3-5 range. Fewer than 15% of the scores fell into the 1-2 range. *Trailing Edge, Highland Ring, Downstream, Nostalgia, Sunset*, and *Limbic* fell into this category (Figure 2).

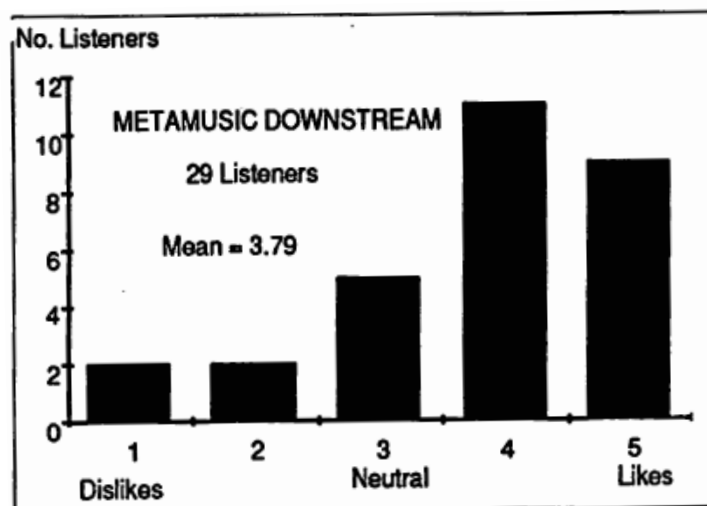


Figure 2

3. *Group C*: Tapes show a broad spread of scores. A good representation for each possible rating from 1 to 5 is seen, with no one scoring range receiving a major proportion of the ratings. These are tapes that elicit a wide range of feelings from listeners, with many persons giving it the lowest possible score and others giving it the highest possible score. *Converse*, *Blue*, *Sam and George*, *Soft and Still*, and *Friends* fit this category. (Figure 3).

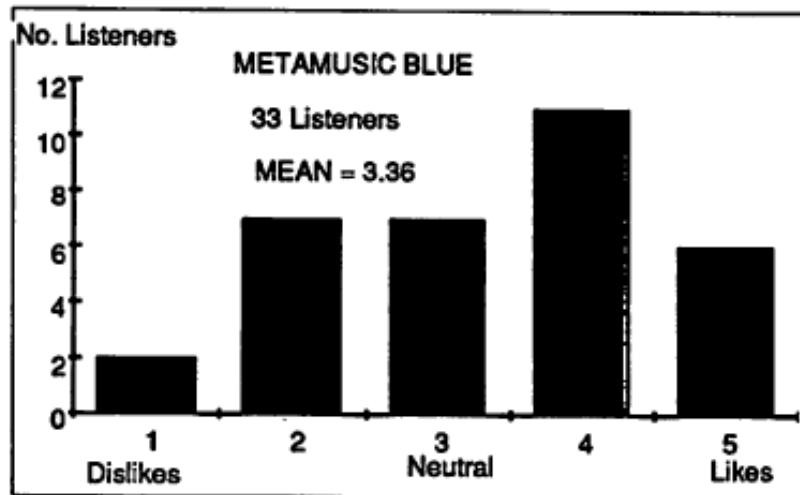


Figure 3

4. *Group D*: Tapes are not liked by listeners. Although 21-26% of the listeners indicated that they liked the tape (by giving it a 4 or 5 score), 45-65% of the listeners indicated that they disliked it. *Green*, *Amber*, and *Sunday* fell into this category (Figure 4).

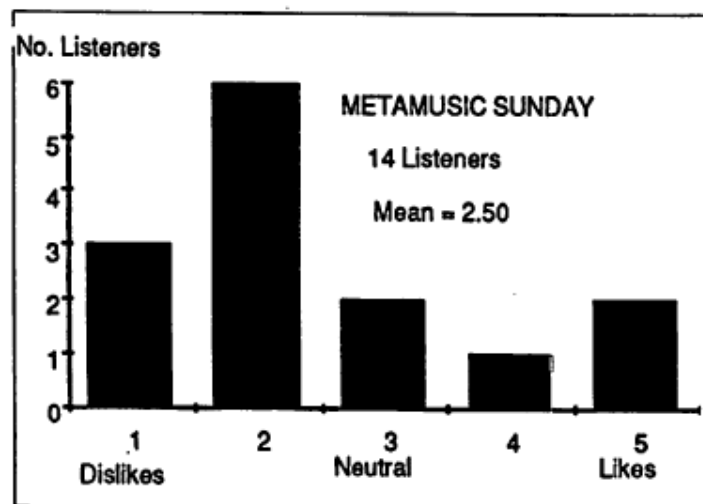


Figure 4

RATINGS OF METAMUSIC TAPES

<u>Tape</u>	<u>Mean</u>	<u>Listeners</u>	<u>% Disliked</u>	<u>% Liked</u>	<u>% Liked or Neutral</u>
Eddys	4.38	24	8.33%	83.33%	91.67%
Modem	4.29	28	3.57%	85.71%	96.43%
Random Access	4.29	14	7.14%	85.71%	92.86%
Trailing Edge	4.28	18	11.11%	77.78%	94.44
Midsummer Night	4.09	22	4.55%	72.73%	90.91%
Back Room	4.06	17	5.88%	70.56%	94.12%
Highland Ring	4.04	28	14.29%	78.57%	85.71%
Downstream	3.79	29	13.79%	68.97%	86.21%
Nostalgia	3.80	20	10.00%	70.00%	90.00%
Limbic	3.75	12	0.00%	66.67%	100.00%
Sam and George	3.53	15	26.67%	53.33%	73.33%
Sunset	3.50	10	20.00%	50.00%	80.00%
Blue	3.36	33	27.27%	51.52%	72.73%
Converse	3.25	12	33.33%	50.00%	66.67%
Soft and Still	3.20	10	20.00%	40.00%	80.00%
Friends	3.13	16	43.75%	50.00%	56.25%
Green	2.80	15	46.67%	26.67%	53.33%
Amber	2.73	15	60.00%	26.67%	40.00%
Sunday	2.50	14	64.29%	21.43%	35.71%

The following tapes were listened to by fewer than 10 listeners. Ratings are not included for these tapes:

Brown and Beige
Pantops

Pacifica
East By West

Outreach
Wayward

TABLE 1

Because the type of listening purpose may play a role in determining how a person feels about a tape, responses to a tape that was used for two different purposes were compared. In the New Visions October workshop, *Modem* was used as background music for a highly specific guided imagery (Learning Purpose Group). In the Monroe Institute Professional Seminar *Modem* was used in an open-ended non-specific meditation/imagery session (Transcendent Purpose Group). In both instances the tapes were presented under headphones and in the privacy of the CHEC units. In the Learning Purpose Group a mean rating of 4.14 was given by 10 listeners. In the Transcendent Purpose Group a mean rating of 4.20 was given by 11 listeners. Although the means for the two groups were similar, the spread of scores was different. 71.43% of the Learning Purpose Group gave liking scores of 4-5 to *Modem*. 91.91% of the Transcendent Purpose Group gave 4-5 scores to the tape. In addition, 14.29% of the Learning Purpose Group stated that they did not like the tape by giving scores of 1-2. 0% of the Transcendent Purpose Group gave *Modem* a 1-2 score.

Discussion

This study is a beginning. It collects preliminary information on listener preferences for individual Metamusic tapes. 10-30 listeners per tape represents a very small sample of those purchasing and listening to Metamusic tapes. 90% of the listeners were women. The type of listening activity (i.e. studying, meditating, relaxing) was not controlled. A broad generalization can not be made either to all listeners or to all situational uses of the tapes.

The music must be considered in relationship to the purpose for which it is being used. Very different responses from listeners may be given if the tape is being listened to for aesthetic purposes, if it is being used as a functional background for learning, if it is used in a therapeutic environment to match or alter emotions, or if it is used to transcend ordinary states of consciousness. In the current study the majority of listeners (75-80%) rated the tapes from their perspective as a functional background to learning. Approximately 20% of the listeners used tapes as a background for meditation or other transcendent activity. An even smaller percentage of ratings were provided by individuals in medical or counseling fields who may have been influenced in their ratings of a tape by its known effectiveness in mood and behavioral shifts with clients. Several professional musicians in the group included their aesthetic responses to the tapes in their personal ratings. The comparisons of Metamusic *Modem* under the two listening conditions seem to indicate that listeners may respond differently to a tape depending upon how it is used. It would be interesting to ask the same group of listeners to respond to a group of tapes repeatedly used for several different listening purposes (i.e. studying, reading, daydreaming/meditating, or in a therapy session). If the tapes were not identified by name, and ratings occurred immediately after use, it would be possible to see if the same listener rated the tape in the same fashion when different purposes were involved.

Listener written comments reveal the importance of looking at the type of activity in which the tape is to be used. Metamusic *Sunday* received the lowest rating (2.50) in this group of listeners. 12 of the 14 listeners were from the Learning Purpose Group. Several listeners commented that the music was boring and they didn't like it because of the minimal shifts in pitch and melody. There was a sameness to the piece that was unappealing to them. One individual who used the music regularly for meditation commented that she liked the unobtrusive quality of the music and noted that the minimal changes that occurred gave an "instrumental chant" quality to the piece.

Additional study of the individual Metamusic tapes would be valuable. A larger number of listeners, a wider variety of listener backgrounds, and a comparison of listener responses under different types of listening conditions would provide information that might enable greater predictability in recommending tapes for ourselves and others.

Metamusic Tape Descriptions

The following descriptions were derived from a careful analysis of the instrumentation and musical style of each Metamusic tape. Information includes a general description of the mood or style created by the music, and the instrumentation. Except where noted, each piece is characterized by a slow tempo without regular rhythms and precisely sustained tempos. All tapes were digitally mastered in their production. These descriptions are useful in the initial selection of tapes to match personal musical preferences and the purpose for which the tape is to be used.

Metamusic Amber

Musically *Metamusic Amber* combines brass instruments and bassoon, blending with the sounds of the strings and harp. Instrumental sounds are produced primarily by the analog synthesizer and organ. Low pitches predominate, and are combined with sensations of physical and psychological tension. Brief periods of dissonance and some abruptness to the flow of the initial third of the piece are present.

Metamusic Back Room

Metamusic Back Room utilizes solo piano, brass and winds with a slow jazz/blues beat and tempo. The instrumental sounds of piano, trumpet, baritone saxophone, clarinet, and flute are produced by the organ and a digital sampling synthesizer. The upbeat instrumentation is supported by slow continuous chord changes giving a sense of flow and continuity.

Metamusic Blue

Metamusic Blue takes the listener through a series of changing arpeggios produced by the organ. Random chord changes underly the arpeggios giving shifts in the feeling tone and subtle shifts in perception.

Metamusic Brown & Beige

Metamusic Brown & Beige produces instrumental solos over soft, long sustained organ and flute chords. Many shifts in both instrumentation and melody occur throughout the piece. Solo instruments include bells, strings, flute, and cello. Musical sounds are produced by the analog synthesizer and the organ.

Metamusic Converse

Metamusic Converse features brass and winds in the initial 2/3 of the piece. This gradually blends into a slow, high pitched bell segment that gives a feeling of movement and drifting. Instrumental sounds are produced by the analog synthesizer and the organ. Although the overall composition retains a free-flowing structure without clear rhythmic patterns, several segments include a descending scale that are very rhythmic in a tempo of approximately 60 beats per minute.

Metamusic Downstream

Metamusic Downstream creates the slow, flowing feeling that is reflected in its title. Flowing, wandering chords sustain the piece throughout. Bell and harp sections echo back and forth between the right and left speakers. Although the instrumental sounds are produced by the analog synthesizer, the piece has an overall church-organ quality.

Metamusic East By West

Metamusic East By West blends the musical signatures associated with Far Eastern and Western cultures. The kyoto and chimes are featured over a background of sustained orchestral chords. The music shifts from minor to major keys as the East-West themes are developed. The nature of the solo instruments gives the piece a very percussive quality which is gradually softened through a blending with the background chords. Music is produced by the analog synthesizer.

Metamusic Eddys

Metamusic Eddys presents solo piano over long sustained chords. A feeling of relaxed easy listening is created as the music provides a continuous flow with minimal changes in melody and general feeling tone. The piano melodies are created from the digital sampling synthesizer. Background chords are provided by an analog synthesizer.

Metamusic Friends

Metamusic Friends begins with the sounds of moving water. These sounds of rapids lead in and out of sections with choir voices, high flute and soft synthesizer sounds. Voice and bamboo flute sounds were recorded live. The piece projects a quiet, relaxed feeling.

Metamusic Green

Metamusic Green features the vibraharp as a solo instrument over long sustained chords produced by strings, woodwinds, and brass. Musical sounds are produced by various stops on the organ. Some dissonance is present in the mid-section.

Metamusic Highland Ring

Metamusic Highland Ring features an opening and closing theme reminiscent of the bagpipe melodies from the Highlands of Scotland. The characteristic drone provides a continuity to the various sections of the piece. Instrumental sounds are produced primarily by the analog synthesizer.

Metamusic Limbic

Metamusic Limbic begins with the solo xylophone-bell. The piece evolves with a swelling, changing texture of long, sustained chords. The xylophone-bell enters once more and concludes this musical selection. Instrumental sounds are produced by the analog synthesizer.

Metamusic Midsummer Night

Metamusic Midsummer Night leads the listener through the gentle sounds of thunder, rain, and crickets that one might hear in the country on a midsummer night. The natural sounds gradually flow into musical themes created by bells and strings, by classical guitar, and by soft voices. The musical sounds are created by analog and digital sampling synthesizers.

Metamusic Modem

Metamusic Modem alternates solo lines produced by strings, brass, and harp over slow harmonic changes. The feeling tone is quiet and pensive. The easy, sustained flow within and between sections of the piece contributes to its use as a background to learning and contemplation.

Metamusic Nostalgia

Nostalgia begins with a wistful melody initiated by the flute and picked up in turn by the strings and the horn. The mood shifts suddenly to a moody, tense, mildly-discordant section with a tympani background. The original melody reappears against the tympani roll and builds to a climax with a return to the original quiet, wistful feel of the piece.

Metamusic Outreach

Outreach begins with the sounds of ocean surf which blend into a slow minor theme developed first in the strings, and then the brass. Musical sounds are created by the analog synthesizer and organ. A wistful feeling is sustained in this free flowing musical piece.

Metamusic Pacifica

Metamusic Pacifica begins with the rolling sounds of ocean surf, and moves through a series of instrumental tones and sound effects that transport the listener to a tropical island. A high

level of active imagery is elicited as the listener has the opportunity to experience the wildlife, weather, and contrasts in feeling tone that are a part of this environment. Sounds are created primarily by the digital synthesizer.

Metamusic Pantops

Metamusic Pantops features the harp (analog synthesizer) in solo lines over slow, moving, sustained chords produced by the brass, string bass, and strings. Major shifts in loudness and feeling tone occur. *Pantops* moves from lyrical to mildly discordant.

Metamusic Random Access

Metamusic Random Access explores improvisation with varied solo instruments and slow harmonic changes. The electric piano, and several varieties of synthesized bells are featured in this piece which provides gradual mood and “color” changes for the listener.

Metamusic Sam & George

Metamusic Sam and George creates a musical dialogue or conversation between the harp and string bass. Sustained background chords of woodwinds and strings create a feeling of continuity, stability, and relaxation. Musical sounds are produced by the analog synthesizer.

Metamusic Soft and Still

Metamusic Soft and Still features the quiet, yet powerful, sounds of ocean surf. A single, simple melody which drifts repeatedly through the breeze is created by the flute. The instrumental sounds blend with those of the surf, and suggest the blending of man and nature.

Metamusic Sunday

Metamusic Sunday uses the organ to create a quiet, sustained moment for the listener. The piece is similar to an instrumental chant with a sameness that allows the listener to focus on inner thoughts without external distraction. The music tends to be moody and somewhat funereal.

Metamusic Sunset

Metamusic Sunset begins with a low chime on one channel and the pipe organ on the other. Gradually the two sounds blend. Moods shift throughout the piece from peaceful to intense, with frequent shifts of instrumentation and melody. The digital synthesizer was used to create the melodies of the organ, chimes, bells, strings, and woodwinds. The bamboo flute was recorded live.

Metamusic Trailing Edge

Metamusic Trailing Edge opens and closes with the slow, tranquil strum of a 12-string guitar. A dream-like feeling evolves through an alternating pattern and blend of strings, harpsichord, and voices. The slow, regular rhythm of the guitar sets the stage for slowing body and mental

rhythms. The music of the guitar was recorded live. The remainder of the musical sounds were created by the analog synthesizer.

Metamusic Wayward

Metamusic Wayward sets a tone of power and anticipation for the listener. Tension is increased through a substantial amount of dissonance in the string base and flute lines. Transitions are smooth and the piece ends on a bright, happy note. A wide variety of instruments produced by the digital and analog synthesizers is used to create the feelings developed in the music.

Factors in Tape Selection

An Approach to Tape Selection

How might one go about selecting tapes for use in a learning or therapeutic session? When the musical preferences or reactions of the client/learner are not well known it often becomes a process of trial-and-error. When tapes must be purchased, this can either be a very expensive venture, or the best-fit of the tapes available may not be fully effective. It is important to develop a personal system for selecting tapes that have the greatest likelihood of enjoyment by the listener. When the musical composition resonates well with the personal patterns of the listener, the Hemi-Sync patterns become more effective. The mind is free to use them for learning. If the music creates an agenda for the person that is counterproductive to learning or growth, full benefit will not be derived from the use of the tapes.

The Metamusic Listener Survey provides a source of information for an initial selection of tapes. When the specific likes or musical interests of a person are unknown, the Law of Probability can be helpful. The Listener Survey describes the pattern of likes and dislikes for 18 of the 24 tapes for a small group of listeners. Although one cannot use this for precise predictions, one can say that it is probable that a tape liked by 85% of those listening would be a better initial choice with a client or classroom than a tape liked by only 25% of the listeners. This is particularly important when Metamusic tapes are played through open speakers to a group of persons.

It would be inappropriate to rely solely on this type of listener survey in deciding which tapes to purchase and use. Additional factors such as personal preferences, listener characteristics and needs, and the purpose for which the music is to be used must be considered. For example in the Metamusic Tape Survey, *Metamusic Nostalgia* received a relatively high rating (3.80), was liked by 70% of the group, and was disliked by only 10% of the listeners. *Nostalgia* begins with a quiet, lyrical melody that is enjoyed by many people. It shifts in the middle third into a segment containing dissonance and a feeling tone that some listeners described as "ominous". When this tape has been used with some neurologically impaired children who show difficulty integrating sensory information, the child's level of withdrawal or agitation often increases

during the dissonant section. Tapes with high frequency sections are occasionally irritating to these children. Thus, in selecting the initial tapes to use in a classroom or therapy session with hypersensitive children, *Metamusic Nostalgia* would not be the best selection. At a later point its use could be explored since individuals with the same basic difficulties are not identical.

Individual Preferences in Music

It is important to remember that each person brings a personal history to a music listening session. Personal experiences, memories, associations with particular types of music, and general neurological organization influence how a person will respond to a new composition. This was also evident in the personal comments of different listeners who participated in the Metamusic Tape Survey. One listener described her enjoyment of the slow, lyrical feeling of *Metamusic Trailing Edge*; another listener found the same piece very depressing. Some of the compositions that featured low pitches and an organ-like instrumentation were described as depressing and oppressive by listeners. One listener asked to have *Metamusic Downstream* removed from the background of a group learning session because it constantly reminded her of her mother's funeral. 68% of the total group of listeners gave *Downstream* a 4 or 5 rating. Many commented that its lower pitches and flowing quality were very relaxing and peaceful. Higher pitches and instruments with very high pitches were perceived by some listeners as being very energizing and "up-beat"; other listeners found the same music strident and irritating. It is not possible to assume that your personal response to a particular piece of music will find a similar level of enjoyment and acceptance by all listeners.

Personal preferences include likes and dislikes for particular instruments, and specific styles of music. Several listeners in the Tape Survey commented that they liked piano music and preferred a tape such as *Metamusic Eddys* that features a solo electric piano and a style that is similar to "easy listening music". Another listener expressed disappointment in *Eddys* because she preferred an acoustic piano and found the electronic sounds unpleasant. The Metamusic series is primarily electronic music, created by various combinations of synthesized sound. However, within this genre there is much variation. Some tapes include live voice or instruments. Others use recorded acoustic instruments whose sounds are used to create music electronically with a digital synthesizer. Other tapes are totally created from the instrumental variations found within the analog synthesizer. The descriptions of each Metamusic tape can provide useful information that will be helpful in selecting tapes for specific listeners or situations.

The musical preferences of the teacher, therapist, or healer are as important as those of the client or student. Whenever music is playing in a shared environment, each person is affected. Music can create an auditory envelope that brings us together. As our internal rhythms begin to move in harmony with the music, we move closer to a oneness with the other person. That oneness allows for a total mind-body-spirit communication and increases our ability to know

the other person and ourself. If the music selected is not in harmony with our being, we deprive ourselves of the richness of this encounter.

Functional and Therapeutic Aspects of Music

In selecting music for a specific purpose, keep in mind characteristics of music that fit that purpose. Much is known about the effects of specific types of sound and music on the human body and mind. The tempo, pitch, rhythm, harmony, consonance/dissonance, and variation in form of the music will influence the way in which the listener perceives its effect. For example, higher pitches are more energizing to the brain. Lower keys may be more relaxing, but may bring out sad feelings or depression in some listeners. Major keys are associated with a happier, lighter quality while minor keys tend to bring out pensive or sadder feelings. Chords and harmonies that are dissonant and clashing may create a feeling of tension in the listener. This may be energizing to some, but may be painful and disorganizing to individuals with an unstable nervous system or those who are ill.

In assisting people to shift or alter moods and levels of activity through music, it has been common to initially select music whose tempo and general essence matches that of the listener. For example, if the person were feeling agitated and showed a high level of activity, a piece with a rapid tempo, higher pitches, and some dissonance may assist in reducing the agitation and hyperactivity. A slow, relaxing piece may have no discernible effect even though one might logically select this type of music to relax. This principle, however, is not as applicable when the reason for the agitation and hyperactivity is related to neurological disorganization and sensory integrative problems. In situations of sensory overload, music with a slow tempo, no dissonance, and a basic organizing structure is very effective in assisting with sensory organization. As the individual develops the ability to integrate and organize sensory input, the level of hyperactivity and agitation is reduced.

Metamusic Back Room features a blues/jazz motif. Because its melody style and instrumentation are more structured and familiar, it was well-received by the majority of listeners in the Metamusic Tape Survey and was actively disliked by only 6% of the group. Unlike many of the tapes in the series, *Back Room* tends to draw the active attention of the listener at many points. When music is used for studying, reading, meditating and other more focused activities, it is better to select pieces that stay in the background and do not compete for the listener's attention. Thus, while *Back Room* would be an excellent tape for foreground listening, activities that do not require undivided attention, and open-ended daydreaming and meditation, it would be less appropriate as a background for a classroom lecture.

Summary

The Metamusic Listener Survey and the Metamusic Tape Description can assist us in making initial decisions for purchasing or using specific tapes. Tapes can initially be selected that have been enjoyed by many, that fit our own personal preferences in music, and that fit the

individuals and the purpose for which we will be using the music. Additional tapes can be explored in our personal and work environments that will enable a more precise selection of tapes that fit our personal and situational needs. It would be helpful if those using the tapes with others would observe the effects of different Metamusic tapes on different types of individuals and in different situations. Let us continue to share in Breakthrough the patterns we are perceiving. Which tapes are most effective with specific types of clients or in specific situations? What additional types of tapes would be important to add to the series? Metamusic offers us a powerful adjunct to our learning and healing ventures. We owe it to ourselves to define our wants more clearly.

Future Directions for Metamusic

The combination of music and Hemi-Sync signals offers a powerful tool for learning, change, and personal growth. The wide variety of musical forms in the current series of Metamusic tapes offers many choices to the listener. Since the Hemi-Sync signals on each of the tapes are similar, differential effects from different Metamusic tapes is primarily the result of the musical composition.

The current Metamusic series was created to provide a background for meditation and transcendent states of consciousness. Although the music has been written with diversity in mind, Metamusic has not been specifically composed to assist specific learning goals, to support specific personal growth in psychotherapy programs, to assist healing, or to support neurological organization and change. It is known that the Hemi-Sync signals themselves can play a major role in therapeutic and educational programs. Compositions to assist specific mental, physical, and emotional development would increase the power of the Hemi-Sync signals combined with them. This would represent the blending of the knowledge associated with the Psychology of Music and Music Therapy with music composition and precise knowledge of the effects of various combinations of Hemi-Sync signals.

The success of such a venture would require a full review of the literature describing precise effects of different musical features on the human organism, and detailed descriptions of the desired behaviors that might be facilitated through a music plus Hemi-Sync background. For example, specific music could be composed to facilitate a regular sleep-wake cycle in a young, neurologically irritable child. Hemi-Sync signals to support the sleep-wake cycle goal could be bedded in the music. For an infant or young child the music might reflect memories of the mother's heart beat or the simple melodies that occur in the early developmental stages of listening to and producing melody. The musical form would be quite different from music composed to assist sleep in the adult. Because of possible differences in brain wave patterns, the Hemi-Sync signals might also be different.

It is up to each person interested in the Metamusic concept to consider ways in which this form of Hemi-Sync can support their professional interests and personal growth. The Monroe Institute welcomes specific suggestions and proposals for therapeutic and functional use of Hemi-Sync and music. The collaboration of interested professionals on a major project to systematically develop and explore the effects of an expanded Metamusic concept would provide a major contribution to our knowledge.

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The many individuals who listened to tapes and shared their feelings about each tape were the backbone of the Metamusic Tape Survey. Their contributions will be felt by all of us in making future tape selections easier.

I hope that this special issue of Breakthrough will serve as a catalyst to each of you in finding some of the answers to your current questions, and in defining new questions that will expand our horizons in understanding the power of music and Hemi-Sync.

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